

Appln. No. 10/089,272
Amendment dated January 28, 2004
Reply to Office Action of November 3, 2003

REMARKS/ARGUMENTS

Reconsideration of the present application, as amended, is respectfully requested.

The November 3, 2003 Office Action and the Examiner's comments have been carefully considered. In response, claims are cancelled and added, the title and abstract are amended, and remarks are set forth below in a sincere effort to place the present application in form for allowance. The amendments are supported by the application as originally filed. Therefore, no new matter is added.

ELECTION/RESTRICTION

The Examiner's indication that claim 3 does not read on the elected embodiment because it requires the "torque transmitting nut" is acknowledged. Accordingly, it is understood that the Examiner is of the opinion that claims 1, 2 and 4-24 read on the elected embodiment and that claims 3 and 25-36 are withdrawn from further consideration as being directed to a non-elected embodiment.

TITLE OF THE INVENTION

In the Office Action the Examiner indicates that the title is not descriptive. In response, the title of the invention is

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amended in a sincere effort to provide a title which is more clearly indicative of the invention to which the claims are directed. If, even in view of the amendment of the title the Examiner maintains his objection, the Examiner is respectfully requested to provide a proposed amended title for Applicants' consideration in the next Patent Office communication.

ABSTRACT

The Abstract is amended to more clearly comply with the requirements for an abstract. No new matter is added.

CLAIM OBJECTIONS

In the Office Action, claims 1, 11, 13, 15 and 16 are objected to because of certain informalities. In response, claims 1, 11, 13, 15 and 16 are cancelled thereby rendering the objection to these claims moot.

REJECTION UNDER 35 USC 112

In the Office Action claim 11-19 are rejected under the second paragraph of 35 USC 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In response, claims

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11-19 are cancelled thereby rendering the rejection under the second paragraph of 35 USC 112 moot.

PRIOR ART REJECTIONS

In the Office Action claims 1 and 2 are rejected under 35 USC 103 as being unpatentable over USP 4,682,906 (Ruckert) in view of German Patent No. 91 12424.7 (ITW). Claims 4, 5, 11, 12, 18 and 19 are rejected under 35 USC 103 as being unpatentable over Ruckert in view of German Patent No. 91 12424.7 (ITW) and further in view of USP 6,135,689 (Matsunami). Claims 6, 7, 13, 14, 20 and 21 are rejected under 35 USC 103 as being unpatentable over Ruckert in view of German Patent No. 91 12424.7 (ITW) and further in view of USP 2,842,180 (Brown). Claims 8, 15 and 22 are rejected under 35 USC 103 as being unpatentable over Ruckert in view of German Patent No. 91 12424.7 (ITW). Claims 9, 10, 16, 17, 23 and 14 (which probably was intended by the Examiner to be "24") are rejected under 35 USC 103 as being unpatentable over Ruckert) in view of German Patent 91 12424.7 (ITW) and further in view of USP 4,043,239 (Defusco).

In response, claims 1, 2 and 4-24 are cancelled and new claims 37-44 are added. Claim 37 is an independent claim and claims 38-44 are dependent on claim 37.

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The present claimed invention as defined by new claim 37 is directed to a fastener which includes a bolt (40), a nut (10) and a movable collar (20). The bolt (40) includes a bolt head (41) and a bolt shank (42). The bolt shank (42) extends from the bolt head (41) and includes external threads (421, 422) thereon. The nut (10) includes a first nut engaging portion (13) for engagement with the external threads (421, 422) of the bolt shank (42), and a second nut engaging portion (14) for engagement with the movable collar (20). The second nut engaging portion (14) is integrally formed with the first nut engaging portion (13).

The nut (10) is capable of being threaded onto the bolt (40) through the first nut engaging portion (13). The movable collar (20) includes a first collar engaging portion (22, 31) for engagement with the external threads (421, 422) of the bolt shank (42), and a second collar engaging portion (21) for engagement with the second nut engaging portion (14) of the nut (10).

The movable collar (20) is capable of being threaded onto the bolt (40) through the first collar engaging portion (22, 31) and is capable of being threaded into the nut (10) through the second collar engaging portion (21) and the second nut engaging portion (14). The second collar engaging portion (21) includes an external thread forming portion formed with an external thread

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of an opposite hand with respect to the external thread (421) formed on the bolt shank (42).

The nut (10) includes an extended cylindrical-shaped portion extended in an axial direction and having an extended outer-peripheral surface and an extended inner-peripheral surface. The extended cylindrical-shaped portion includes a cavity defined by the extended inner-peripheral surface which includes an internal thread forming portion formed with an internal thread being capable of threading onto the external thread formed on the second collar engaging portion (21). The movable collar (20) can be received in the cavity when it is threaded and inserted into the nut (10).

When the movable collar (20) is received in the cavity, when the second nut engaging portion (14) of the nut (10) is inserted through an opening (OP1) formed in one (M1) of two members (M1, M2) formed with openings (OP1, OP2) and the bolt (40) is threaded into the movable collar (20) through the opening (OP2) formed in the other (M2) of the two members, and then torque is applied to the bolt head (41), the movable collar (20) is extended toward the other (M2) from the cavity and the nut (10) is threaded onto the bolt (40) through the first nut engaging portion (13), whereby one (M1) is latched on the nut (10) and the other (M2) is latched on the movable collar (20), so that the two members (M1,

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M2) are fastened by the bolt head (41), the nut (10), and the movable collar (20).

The present claimed invention has at least the following features:

the nut (10) includes a cavity capable of receiving therein the movable collar (20) (see Fig. 5(1) or Fig. 6(1) of the present application);

with the movable collar (20) being received in the cavity, the second nut engaging portion (14) of the nut (10) can be inserted through an opening (OP1) formed in a member (M1) (see Fig. 5(1) or Fig. 6(2));

one member (M1) is latched on the nut (10) and the other member (M2) is latched on the movable collar (20) (see Fig. 5(8) or Fig. 6(3));

the first nut engaging portion (13) is integrally formed with the second nut engaging portion (14) (see Fig. 1 in the present application); and

when the two members (M1, M2) are to be fastened, the nut (10) threads onto the bolt (40) through the first nut engaging portion (13) (see Fig. 5(2) and 5(3) in the present application).

The fastener disclosed in ITW (German Patent No. 91 12424.7) is used to fasten a first member 10 and a second member 12 together. However, in ITW it is necessary to weld a weld nut 44

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to the member 10 and to use a nut 48 separate from a spacer 30. Refer-ring to Fig. 1 of ITW, there is a need to insert a screw 14 and the spacer 30 into a hole 40 formed in the first member 10 from a left side in Fig. 1, projecting a shank 18 of the screw 14 from the hole 40, projecting the shank 18 from hole 42 formed in the second member 12, and then threading the nut 48 onto the shank 18 which is extended from the hole 42 from a right side in Fig. 1.

The fastener according to the present claimed invention and the screw 14 disclosed in ITW are contrasted below.

As stated above, ITW teaches to weld a weld nut 44 to the member 10 prior to fastening. In contrast, with the fastener according to the present claimed invention, with the movable collar (20) received in the nut (10), the nut (10) and the movable collar (20) can be inserted through the opening (OP1), so that without welding a nut to a member to be secured, it is possible to complete the fastening.

Further, with the screw 14 disclosed in ITW, there is a need of finally having the nut 48 threaded onto the shank 18 extended from the hole 42. In contrast, as stated above, with the fastener according to the present claimed invention, the first nut engaging portion (13) is integrally formed with the second nut engaging portion (14). When the two members (M1, M2) are to

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be fastened together, the nut (10) threads onto the bolt (40) through the first nut engaging portion (13).

As apparent from the above, in the case of the fastener according to the present claimed invention, there is no need to use a separate nut and to weld the nut onto the member being secured prior to insertion of the screw. As a result, the fastening of the present claimed invention is easier as compared to ITW.

Ruckert teaches that with the screw 27, fastening is achieved without the use of a nut as in the screw 14 disclosed in ITW. Instead of using a nut, a threaded hole 81 is formed in a member 79 and is used for fastening with the screw 27 disclosed by Ruckert. That is, the screw 27 disclosed by Ruckert cannot fasten two members (79' and 79) together unless thread ridges are beforehand formed in the member 79. Therefore, it is necessary prior to fastening not only to form a hole in the member 79 but also to form thread ridges on the member 79. Further, when the member 79 is thin, it is difficult to form thread ridges on the member. In such a case, the member 79' and the member 79 cannot be fastened together unless a mount part such as a separate nut or the like is used in the same manner as in the screw 14 disclosed in ITW.

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In contrast, as stated above, with the fastener according to the present claimed invention, the first nut engaging portion (13) is integrally formed with the second nut engaging portion (14) and when the two members (M1, M2) are to be fastened together, the nut (10) threads onto the bolt (40) through the first nut engaging portion (13).

Therefore, when the fastener according to the present claimed invention is used, formation of only the opening (OP1) in the member (M1) makes it possible to fasten the two members (M1, M2) together without further formation of a thread ridge. Further, even when a member being fastened is small in thickness, the two members (M1, M2) can be fastened together without the use of a mount part such as a nut or the like. In this manner, the fastener according to the present claimed invention not only eliminates some of the work on members being fastened but also reduces the number of mount parts required for fastening, whereby the fastening work can be facilitated.

As stated above, the fastener according to the present claimed invention enables fastening without the need for welding a nut onto the member being secured, forming thread ridges thereon, or preparing a separate mount part.

That is, the present claimed invention as defined by new claim 37 is patentable over the cited references because the

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references do not disclose, teach or suggest, when taken either alone or in combination, inter alia:

a nut including a first nut engaging portion for engagement with the external threads of the bolt shank, and a second nut engaging portion for engagement with the moveable collar, the second nut engaging portion being integrally formed with the first nut engaging portion; and/or

a movable collar including a first collar engaging portion for engagement with the external threads of the bolt shank, and a second collar engaging portion for engagement with the second nut engaging portion of the nut; and/or

the movable collar being threaded onto the bolt through the first collar engaging portion and being threaded into the nut through the second collar engaging portion and the second nut engaging portion; and/or

the second collar engaging portion including an external thread forming portion formed with an external thread of an opposite hand with respect to the external thread formed on the bolt shank; and/or

when the movable collar is received in the cavity, when the second nut engaging portion of the nut is inserted through an opening formed in one of two members formed with openings and the bolt is threaded into the movable collar through the opening

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formed in the other of the two members, and then torque is applied to the bolt head, the movable collar is extended toward the other of the two members from the cavity and the nut is threaded onto the bolt through the first nut engaging portion, whereby one member is latched on the nut and the other member is latched on the movable collar so that the two members are fastened by the bolt head, the nut and the movable collar (see claim 37, lines 6-47).

In view of the foregoing, claim 37 is patentable over the cited references under 35 USC 102 as well as 35 USC 103.

Claims 38-44 are either directly or indirectly dependent on claim 37. Claims 38-44 are patentable over the cited references in view of their dependence on claim 37 and because the references do not disclose, teach or suggest each of the limitations set forth in claims 38-44.

It is respectfully submitted that no additional fees are due for the presentation of claims 37-44. However, if any additional fees are due, please charge our Deposit Account No. 06-1378 for such sum.

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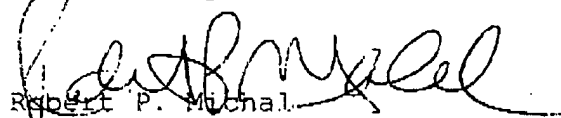
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Reply to Office Action of November 11, 2003

Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner disagrees with any of the foregoing, the Examiner is respectfully requested to point out where there is support for a contrary view.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



Robert P. Michal
Reg. No. 35,614

Frishauf, Holtz, Goodman & Chick, P.C.
767 Third Avenue - 25th Floor
New York, New York 10017-2032
Tel. (212) 319-4900
Fax (212) 319-5101
RPM/ms